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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/558,544	11/16/1995	SHUNPEI YAMAZAKI	0756-1441	3919

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EXAMINER

KANG, DONGHEE

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 03/13/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

08/558,544

Applicant(s)

YAMAZAKI, SHUNPEI

Examiner

Donghee Kang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-59 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-59 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Acknowledgment*

1. Applicant's Amendment and Response to Paper No.29 has been entered and made of Record. New claims 41-59 are added. Thus claims **1-59** are pending in this Office Action.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims **5 & 19** are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Koji (JP 2-143,572).

Koji discloses a device for sensing a light comprising (Fig.3):

a semiconductor layer (2) over a substrate (1); a photoelectric conversion semiconductor device on said substrate, a semiconductor region of the photoelectric conversion semiconductor device comprising a p-type impurity (2-1) semiconductor region, an intrinsic semiconductor region (2-2), and an n-type impurity semiconductor region (2-3); and a thin film transistor over the substrate, an active layer of the thin film transistor comprising a source region, a drain region, and a channel region;

wherein said semiconductor regions are arranged in order with said p-type impurity semiconductor region adjacent said intrinsic semiconductor region and said

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intrinsic semiconductor region adjacent said n-type impurity semiconductor region in said photoelectric conversion semiconductor device, said order being in a direction perpendicular to that in which a light to be sensed is incident thereon, and wherein the semiconductor region of the photoelectric conversion semiconductor device and the active layer of the thin film transistor comprise the same semiconductor layer.

Although the device of Koji was not fabricated by same process step as claimed invention, the resultant structure of the process steps in claims are anticipated by Koji.

The product-by-process claims are given no patentable weight. A product-by-process claim directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See *In re Fessman*, 180 USPQ 324, 326 (CCPA 1974); *In re Marosi et al.*, 218 USPQ 289, 292 (Fed.Cir.1983); and particularly *In re Thrope*, 227 USPQ 964, 966 (Fed. Cir. 1985), all of which make it clear that it is the patentability in a "product-by-process" claim, and not the patentability of the process step, which must be determined in a "product-by-process" claim, and not the patentability of the process. See also MPEP 2113. Moreover, an old and obvious product produced by a new method is not a patentable product, whether claimed in "product by process" claims or not.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims **1-4, 6-8, 15-18, 20-22, 29-30, 41-45, & 49-55** are rejected under 35 U.S.C. 103(a) as being unpatentable over Koji (JP 2-143,572) in view of Yamazaki et al. (US 4,581,620).

Regarding claims **1-2, 4, 6-8, 17-18, 20-22, 25-30, & 41-45**, Koji discloses a device for sensing a light comprising (Fig.3):

a light sensor region and a semiconductor switch region adjacent to and operative connected with said light sensor region over a substrate, wherein a semiconductor region of the light sensor region and an active region of the semiconductor switch comprise the same conductive layer, wherein said image sensor region comprises at least two semiconductor regions (2-1 - 2-3) having different electrical properties and forming a junction. Koji does not teach the semiconductor layer is a semi-amorphous structure wherein a Raman spectrum of the semiconductor layer exhibits a peak deviated from that which stands for a single crystal for the semiconductor. However, Yamazaki teaches the light sensor region (Fig.1G) and the active region 63 of transistor (Fig.6H) are both made of the semi-amorphous 7 formed on silicon wafer covered the entire area of its surface with a silicon oxide film (Col.10, lines 63-68), wherein the semi-amorphous semiconductor comprises a hydrogen doped silicon (Col.3, lines 16-34). Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the crystalline Si of Koji with a well known semi-amorphous semiconductor as taught by Yamazaki, since the semi-amorphous semiconductor provides a large optical absorption coefficient as compared with a single crystalline Si semiconductor. Accordingly, with a semi-amorphous

semiconductor layer of sufficiently smaller thickness than layer-shaped single crystal semiconductor of the semiconductor device using the single crystal semiconductor, it is possible to achieve a higher photoelectric conversion efficiency than that obtainable with the single crystal semiconductor device. Yamazaki does not explicitly teach the Raman spectrum of the semi-amorphous semiconductor exhibits a peak deviated from that, which stands for a single crystal for the semiconductor and has an electron mobility 15-300 cm<sup>2</sup>/Vsec and a hole mobility 10-200 cm<sup>2</sup>/Vsec. However, this feature is inherent since both semiconductor layers in Yamazaki's device and claimed structure has a same material, semi-amorphous semiconductor.

Regarding claim **3 & 48-55**, Koji as modified by Yamazaki teaches the light sensor device uses in the electric equipment, such as a facsimile machine and image sensor.

6. Claims **9-14, 23-28, 31-40, 46-48, & 56-59** are rejected under 35 U.S.C. 103(a) as being unpatentable over Koji in view of Yamazaki and further in view of Misawa et al. (US 5,250,931).

Regarding claims **9-14, 23, 31-40, 46-48, & 58-59**, Koji teaches a semiconductor device comprising (Fig.3):

a substrate, first and second islands on said substrate; p-type impurity region in said first semiconductor island with a first channel region interposed therebetween and in a first region of said third semiconductor island; an insulating film (4) on said first and second semiconductor islands; a gate electrode (2-1) over said first channel regions

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with said insulating film interposed therebetween. Koji does not teach a blocking layer on said substrate and a Raman spectrum of said first and second semiconductor islands exhibits a peak deviated from that which stands for a single crystal of the semiconductor. However, Yamazaki teaches the light sensor region (Fig.1G) and the active region 63 of transistor (Fig.6H) are both made of the semi-amorphous 7 formed on silicon wafer covered the entire area of its surface with a silicon oxide film (Col.10, lines 63-68), wherein the semi-amorphous semiconductor comprises a hydrogen doped silicon (Col.3, lines 16-34). Although Yamazaki does not explicitly teach the Raman spectrum of the semi-amorphous semiconductor exhibits a peak deviated from that, which stands for a single crystal for the semiconductor and has an electron mobility 15-300  $\text{cm}^2/\text{Vsec}$  and a hole mobility 10-200  $\text{cm}^2/\text{Vsec}$ , this feature is inherent for the same reason as given rejection of claims 1 & 8 (see above). Neither Koji nor Yamazaki teaches the semiconductor switch comprises complementary p-channel and n-channel thin film transistors. However, Misawa et al. teaches in Fig.4D the driver circuit portion comprises p-channel and n-channel thin film transistors (132 & 133). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Misawa with Koji as modified by Yamazaki, since the complementally p-channel and n-channel thin film transistors requires a small power to operate the device. Such modification provides Koji's device as modified by Yamazaki with lower power consumption.

Regarding claims **56-57**, Koji as modified by Yamazaki teaches the light sensor device uses in the electric equipment, such as a facsimile machine and image sensor.

***Response to Arguments***

7. Applicant's arguments with respect to claims 1-30, 41-45, & 48-55 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghee Kang whose telephone number is 703-305-9147. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers



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for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Tom Thomas

DHK  
March 4, 2002

TOM THOMAS  
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